CHAPTER 7: SYSTEM ANALYSIS

Transportation planning has a significant impact on the guided, predictable growth of an area and the quality of life of the system users. It can act as a catalyst for economic development as well as provide safe and efficient movement of people and goods. The complete transportation system is comprised of many components, including different levels of jurisdictional authority and facilities; and many different modes (roads, pedestrian paths, bicycle paths, transit systems, railroads, waterways, and airports).

To be able to adequately plan for transportation system improvements, all of the modes have to be acknowledged and specifically evaluated. The following is a comprehensive evaluation of all the modes based on pavement evaluation ratings, the 2008-2012 MITW Transit Development Plan, transit performance measures, the 2008 Menominee County/Tribe Specialized Transportation Coordination Action Plan, crash and demographic data.

MENOMINEE COUNTY & TOWN ROAD NETWORK

Pavement Surface Evaluation and Rating (PASER)

Every two years, all jurisdictions in Wisconsin are required to rate the condition of their local roads and submit the information to WisDOT. The surface condition rating of each road is updated in the State's computer database, the Wisconsin Information System for Local Roads (WISLR). The WISLR database is available to all jurisdictions via the internet and can be used to develop a capital improvement and maintenance program. The WISLR analysis is based, in most cases, on the PASER road rating method. Within the MITW Reservation the only roads required to be rated with PASER are those roads owned by the county or local jurisdictions. The TTP inventory is rated by the BIA and is explained further in the next section.

PASER is a visual survey method used to rate the condition of the roads through the condition of various types of pavement distress on a scale of 1-10. PASER uses 10 separate ratings with 1 being the worst and 10 being a newly constructed pavement. PASER measures the distress of a pavement's surface through sound engineering principles.

Routine Maintenance

Roads with PASER of 8, 9 and 10 require routine maintenance. Routine Maintenance is the day-to-day, regularly-scheduled activities to prevent wear and tear on the roadway surface. This includes street sweeping, ditch maintenance, gravel shoulder grading, and crack sealing. This category also includes roads that are newly constructed or recently seal-coated and require little or no maintenance.

Capital Preventive Maintenance

PASER ratings 5, 6, and 7 are included in this category. Capital preventive maintenance (CPM) is at the heart of asset management. It is the planned set of cost effective treatments to an existing roadway that retards further deterioration and maintains or improves the functional condition of the system without significantly increasing the structural capacity. The purpose of CPM is to protect the pavement structure; slow the rate of deterioration; and/or correct

pavement surface deficiencies. Roads in this category still show good structural support but the surface is starting to deteriorate. CPM is intended to address pavement problems before the structural integrity of the pavement has been severely impacted.

Structural Improvements

Roads with a PASER rating of 1, 2, 3, or 4 are in need of some type of structural improvement such as resurfacing or major reconstruction. Rutting is beginning to take place. Alligator cracking is evident.

Menominee County & Town PASER

The Menominee County and Town local paved roads have been compiled in **Table 7-1.** for 2007, 2009 and 2011. In 2011, 65.2 percent of the total roads were rated a PASER score of 8, 9 or 10, which identifies those roads that are structurally sound and only require routine maintenance. This is a decrease from 2009 (81.9 percent) and 2007 (74.0 percent) PASER scores. PASER scores 5, 6 and 7 represent those roads that are structurally sound, but require capital preventive maintenance such as chip seals and seal coats. In 2011, 25.3 percent of the total roads rated have a PASER score of 5, 6 or 7, which is an increase from 2007 (10.3 percent) and 2009 (9.0 percent). PASER scores 1, 2, 3 or 4, which represent roads with no structural integrity and will eventually require complete reconstruction have decreased from 2007 (15.7 percent) to 2011 (9.5 percent).
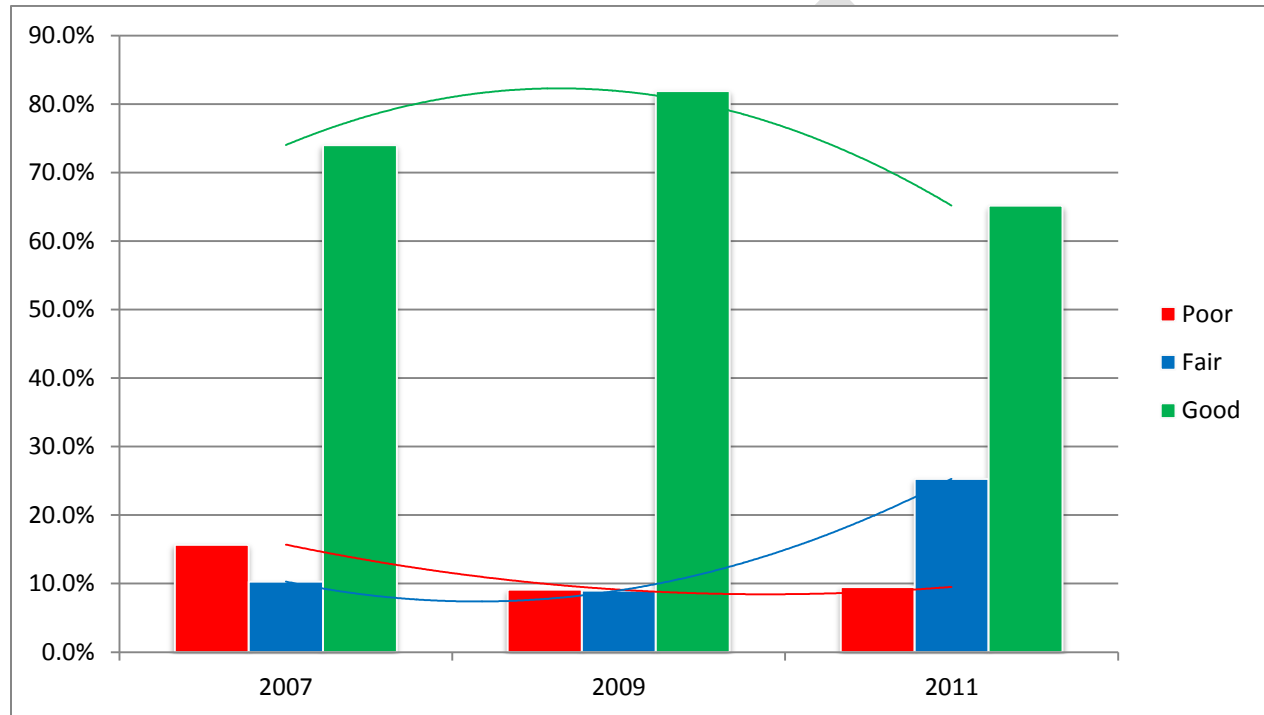
Table 7-1. Menominee County & Town Total Mileage of Paved Local Function Roads by PASER 2007, 2009 and 2011								
2007			**2009**			**2011**		
Rating	**Mileage**	**Percent**	**Rating**	**Mileage**	**Percent**	**Rating**	**Mileage**	**Percent**
1	0.00	0.0%	1	0.00	0.0%	1	0.00	0.0%
2	0.00	0.0%	2	0.00	0.0%	2	0.00	0.0%
3	7.69	8.8%	3	5.17	5.9%	3	6.83	7.6%
4	6.06	6.9%	4	2.84	3.2%	4	1.69	1.9%
5	2.75	3.1%	5	0.15	0.2%	5	3.17	3.5%
6	1.48	1.7%	6	2.23	2.5%	6	4.10	4.6%
7	4.80	5.5%	7	5.51	6.3%	7	15.38	17.2%
8	29.70	33.9%	8	28.89	32.9%	8	22.77	25.4%
9	2.05	2.3%	9	11.45	13.1%	9	17.77	19.9%
10	33.11	37.8%	10	31.50	35.9%	10	17.78	19.9%
Total	**87.63**	**100.0%**	**Total**	**87.73**	**100.0%**	**Total**	**89.49**	**100.0%**

Source: Wisconsin Department of Transportation, WISLR 2007, 2009, and 2011

The goal of any municipality when it comes to investing in its infrastructure is to use their monies in the most efficient and effective way possible. Paved roads shift from one PASER category to another as the road deteriorates. Evaluating PASER scores over time allows an agency to gauge the structural integrity of their roads and the effectiveness of their road treatments to slow the rate of deterioration. **Figure 7-1.** Illustrates the PASER shift over time. The PASER scores are split into three categories: poor, fair and good. The structurally

compromised roads or the "poor" category (PASER 1, 2, 3 and 4) have decreased over time, which means that the County/Towns are reconstructing a number of its roads on an annual basis to keep up with those roads deteriorating from the "fair" category (PASER 5, 6 and 7). The "fair" category has increased over time, which means that the "good" category (PASER 8, 9, and 10) are deteriorating faster than the County/Towns can keep up. This could be due to lack of funds or choice of treatments.

Figure 7-1. **Menominee County and Town paved local function roads by PASER 2007, 2009 and 2011**

Source: Wisconsin Department of Transportation, WISLR 2007, 2009, and 2011

The County/Town also has a number of roads that are unpaved and scored using PASER. **Table 7-2.** compiles County/Town total mileage of unpaved local function roads for 2007, 2009 and 2011. The PASER scores used to rate paved roads are completely different from the PASER scores used to rate unpaved roads. Unpaved roads that have a PASER score of 1 represents roads that have failed and require complete rebuild. A PASER score of 2 represents a poor road and requires additional aggregate plus drainage maintenance. A PASER score of 3 represents a fair road and needs routine regarding and minor ditch maintenance. A PASER score of 4 represents a good road that has a good crown and drainage. Finally a PASER score of 5 represents an excellent road with excellent crown and drainage. The majority of Menominee County and Town's unpaved roads, 84.7 percent in 2011 rate a PASER score of 3 and above. This number is fairly consistent in 2007 (79.0 percent) and 2009 (89.9 percent).

Table 7-2. Menominee County & Town Total Mileage Un-paved Local Function Roads by PASER 2007, 2009 and 2011								
2007			**2009**			**2011**		
Rating	**Mileage**	**Percent**	**Rating**	**Mileage**	**Percent**	**Rating**	**Mileage**	**Percent**
1	0.73	2.1%	1	0.43	1.2%	1	0.43	1.1%
2	6.76	19.0%	2	3.52	9.9%	2	5.48	14.2%
3	24.84	69.8%	3	28.41	79.7%	3	24.74	64.0%
4	2.87	8.1%	4	3.17	8.9%	4	3.75	9.7%
5	0.39	1.1%	5	0.12	0.3%	5	4.22	10.9%
Total	**35.60**	**100.0%**	**Total**	**35.65**	**100.0%**	**Total**	**38.63**	**100.0%**

Source: Wisconsin Department of Transportation, WISLR 2007, 2009, and 2011

The County/Town PASER 2007, 2009 and 2011 are illustrated in **Exhibit 7-1 a-c**.

TTP Condition Inventory

The MITW and the BIA use TTP condition inventories to manage their roads. Condition inventories are management tools typically used by system operators in determining the existing status of the transportation system and for comparing maintenance and improvement needs. Road condition inventories provide information on road design, traffic volumes, surface type and width, shoulder type and width, and surface and shoulder condition. The condition inventory is used by MITW and BIA to examine the needs for suggested construction improvements and for estimating cost.

Part of the condition inventory is the condition rating, which is used to rate the wearing surface (pavement or gravel) of the road. The condition rating is an average of a number of characteristics that are each rated from 0 to 5. A rating of 0 represents a poor surface and a rating of 5 represents a good surface. The average condition rating for each wearing surface is then multiplied by 20 to calculate the Surface Condition Index (SCI) score or the wearing surface rating, which ranges from 0 to 100. A SCI score 0 to 33 represents poor surfaces, a SCI score 34 to 67 represents fair surfaces and a SCI score 68 to 100 represents good surfaces.

The 2007 to 2011 SCI scores for the MITW Reservation paved roads and gravel roads are compiled and displayed in **Table 7-3**, **7-4**, **Figure 7-2**, **7-3** and **Exhibit 7-2a -e**.

Table 7-3. Paved Miles of Roadway					
Surface Condition Index	**2007**	**2008**	**2009**	**2010**	**2011**
Poor (0-33)	19.83	15.79	15.79	15.79	15.79
Fair (34-67)	76.97	81.47	79.90	92.46	77.93
Good (68-100)	17.19	14.83	15.22	15.26	50.93
Total	113.99	112.09	110.91	123.51	144.65

Table 7-4. Gravel Miles of Roadway					
Surface Condition Index	**2007**	**2008**	**2009**	**2010**	**2011**
Poor (0-33)	23.54	23.54	23.64	21.55	21.55
Fair (34-67)	211.54	217.86	216.04	216.39	211.97
Good (68-100)	0.00	1.30	1.30	1.30	20.06
Total	235.08	242.70	240.98	239.24	253.58

Figure 7-2. MITW Reservation SCI Ratings Paved, 2007-2011
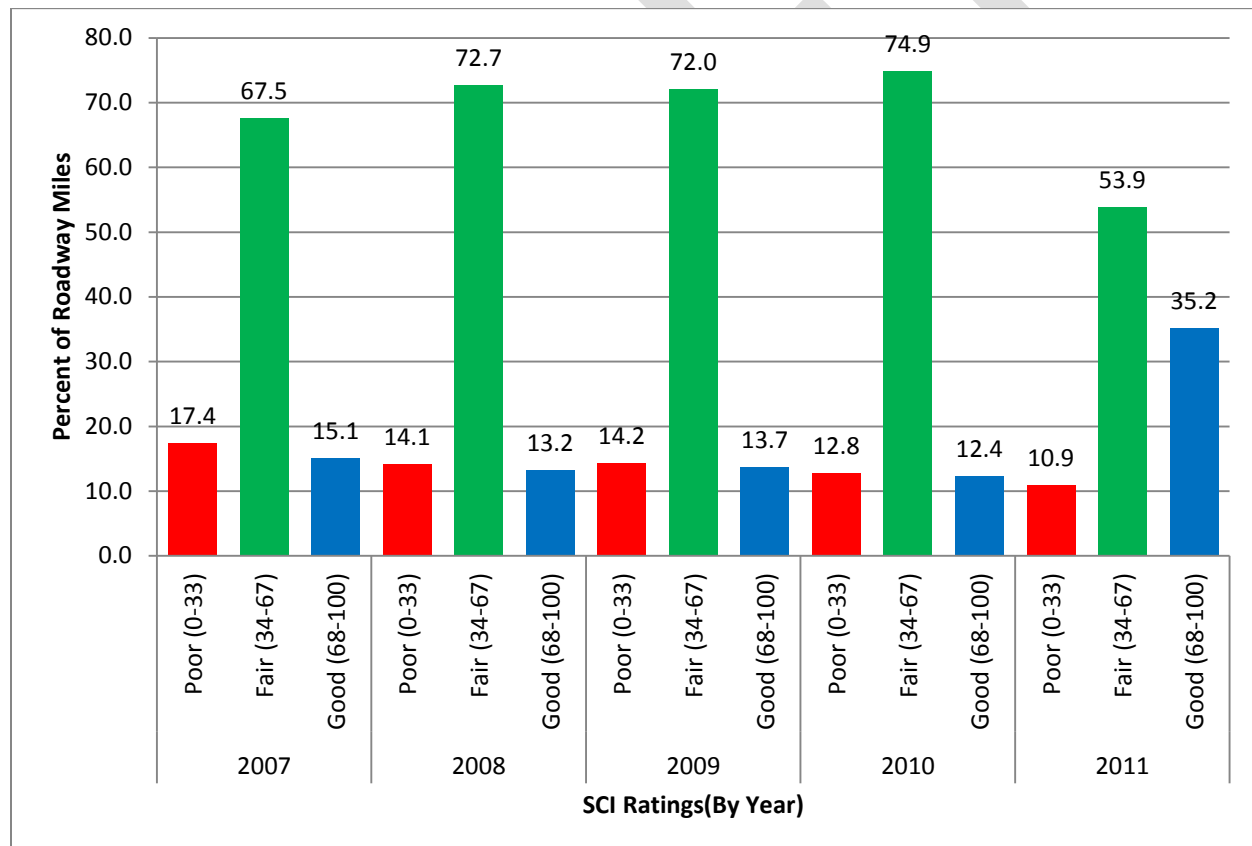
Figure 7-3. MITW Reservation SCI Ratings Un-Paved, 2007-2011
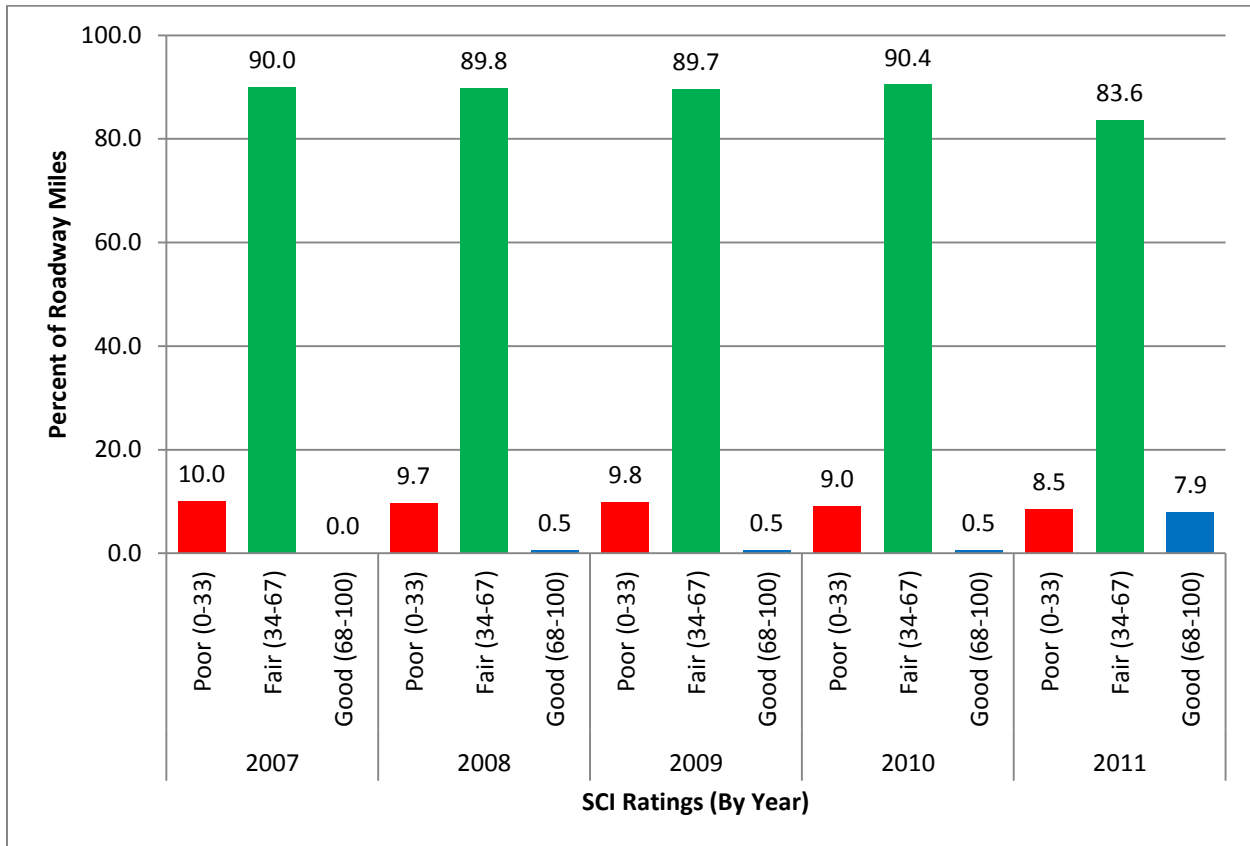
The SCI ratings from 2007-2011 for both paved and unpaved roads can be used in the same way PASER was used previously in this chapter. The SCI ratings are a tool for agency to gauge the structural integrity of their roads and to determine the effectiveness of their road treatments over the years. This method of evaluating the roads can be used for both paved and unpaved roads.

It is apparent from looking at **Figure 7-2**. that the paved roads have been maintained on a regular basis. Paved roads have remained fairly consistent from 2007 to 2010, but in 2011 there was a significant shift from the poor and fair category to the good category. This is most likely the result of a reconstruction projects that took place the previous year. This is also a great opportunity for the Tribe to use preventive measures to keep the good paved roads in that category as long as possible. **Figure 7-3**. presents a similar story; the SCI ratings for gravel roads from 2007 to 2010 have remained fairly consistent. In 2011 there is a major shift of poor and fair gravel roads to the good category. This is most likely the result of some major improvements to the system that took place the previous years. It is important for the Tribe to try to preserve the good gravel roads with proper preventative measure to maximize the life of the gravel roads. The MITW should continue to utilize SCI data to evaluate their roads over time and to ensure they are using the most efficient treatments available.

Bridge Maintenance

Bridge maintenance is accomplished through the contract with County and Menominee Tribal Enterprises (MTE) and inspected by the BIA and the State every two years. The Community Development Engineer and Technical personnel overlook the work to ensure the contracts are being followed by MTE and the County and also do additional inspections of the bridges throughout the time between inspections based on Quality Assurance and Quality Control (QAQC). There are BIA bridges and State bridges on the reservation and the reports generated from the inspections every two years look for the same deficiencies such as the pavement, types of cracks, guardrails, and settlement. Routine maintenance continues throughout the year to clear brush, inspect guardrails, and inspect the signs.

MITW DEPARTMENT OF TRANSIT SERVICE TRANSIT DEVELOPMENT PLAN 2008-2012

The planning process for the MITW DTS Transit Development Plan (TDP) began in 2005 and was approved in 2008. The purpose of the TDP is to provide the framework for the DTS to continue to meet the needs of the Tribe's citizens.

The TDP evaluated the following:
- Existing service and future demand;
- Need and attitude about existing service;
- Travel demand estimation; and
- Organizational structure.

The TDP used population forecast, bus rider survey, and transit demand estimation to evaluate the transit system and provide recommendations.

The TDP projected reservation population to grow about 25 percent to 6,314 in 2010 from a population of 4,857 in 2008. The added population, specifically an increase in elderly population, would increase the demand on transit.

The bus rider survey was distributed to the riders and 80 surveys were returned. According to the survey 48.8 percent of riders use transit because they don't own a car. The single most important factor relating to bus transportation was safety with 81.3 percent indicating a safe bus driver is important. The greatest dissatisfaction passengers had was with the fare cost of riding transit, with 10.0 percent dissatisfied. The average age of those surveyed was 35.3.

The need and demand for the transit system was determined by travel demand estimations. Travel demand is an estimate of total ridership that actual transit service captures; it represents the portion of total need that can be served based upon specific transit operating characteristics. Demand is affected by factors such as fare, frequency, operating hours per day, reliability, advanced reservation requirements and others. The TDP used two travel demand techniques in its estimations: the Arkansas Public Transit Needs Assessment Model (APTNA) equation and the Peterson and Smith model. The APTNA equation uses proportional demand equations which apply trip rates to stratified population groups and the Peterson and Smith model uses proportional demand equations with level of service measures. Both techniques were used in addition to actual experience to come up with best estimates possible. The

compilation of the two travel demand model techniques; actual experience for calibration; the high percentage of elderly residents; and a total population isolated from grocery stores, dry goods and long term medical care indicated that the MITW is a "High Need and High Demand" service area.

Based off of the evaluation, the TDP recommended the following:

1. Reconfigure current service to add fixed routes with fixed schedules.
2. Seek more partners for coordination.
3. Provide more training to staff in area of customer services.
4. Improve marketing and image.
5. Increase services to out of county destinations.

Although, the 2010 populations did not increase, but in fact decreased from 4,857 in 2008 to 4,513 in 2010 the recommendations from the TDP are still relevant. The recommendations are designed to not only account for increased population, but also to make the transit process more efficient while providing a better overall service.

MITW TRANSIT PERFORMANCE MEASURE ANALYSIS

The Menominee DTS is constantly looking for ways to improve their operations efficiency to increase the overall service to the community. One way a transit agency determines overall proficiency is through performance measures. Performance measures in this case are determined by the overall average of transit agencies within Menominee Transit's peer group, which is defined as all bus (i.e. non-taxi) systems that received funds through the state's federal allotment of Section 5311 funds. The City of Monona is included in this analysis because it is a small-scale system that has costs on the level of the rural bus systems. Section 5311 funds are applied for on an annual basis, which provides operating, capital and administrative resources for rural and small urban public transportation systems. As part of the application process; WisDOT collects transit data that they use for cost-efficiency studies. The transit data can also be used to determine how well a transit agency is doing compared to its peer group. Transit data collected include revenue hours, ridership, revenue miles, total operating cost, operating cost per hour, operating cost per passenger, operating cost per mile, passenger per hour and passenger per mile. **Tables 7-5. to 7-7.** depict transit data and performance measures for Menominee Transit and other transit agency within its peer group from 2009 to 2011.

Menominee Transit from 2009 to 2011 has reduced their operating cost per revenue hour by 6.3 percent, their operating cost per passenger by 24.5 percent and their operating cost per mile by 11.9 percent. In 2011, Menominee Transit met their performance measures by falling just below the transit agency average operating cost per revenue hour, per mile and per person. Menominee Transit's passengers per mile and passengers per hour fell below the transit agency average in all recorded years. The reason why Menominee Transit is not meeting passenger per mile and passengers per hour averages is most likely because of their vast coverage area.

Table 7-5. Wisconsin small urban/rural bus systems- Menominee peer group 2009												
---	Menominee	Oneida	Adams Co.	Bay Area Rural Transit (BART)	Dunn Co.	Rusk Co./Ladysmith	Manitowoc	Merrill	Monona	Sauk Co.	Sawyer Co.	Stevens Pt.	Average
Revenue Hours	30,637	22,339	4,140	23,322		7,952	28,248	6,616	4,346		19,814	21,060	16,847
Ridership	78,177	51,131	4,489	89,938		23,401	334,125	71,162	16,839		74,167	225,914	96,934
Revenue Miles	661,615	370,404	102,600	459,848		107,747	464,952	73,743	57,035		490,149	258,631	304,672
Total Operating Costs	$1,564,338	$980,716	$137,868	$935,628		$467,192	$2,025,665	$473,395	$168,788		$1,144,119	$1,311,483	$920,919
Operating Costs per revenue hour	$51.06	$43.90	$33.30	$40.12		$58.75	$71.71	$71.55	$38.84		$57.74	$62.27	$52.92
Operating Costs per passenger	$20.02	$19.18	$30.71	$10.40		$19.96	$6.06	$6.65	$10.02		$15.43	$5.81	$14.43
Operating Costs per mile	$2.36	$2.65	$1.34	$2.03		$4.34	$4.36	$6.42	$2.96		$2.33	$5.07	$3.39
Passengers per hour	2.55	2.29	1.08	3.86		2.94	11.83	10.76	3.87		3.74	10.73	5.37
Passengers per mile	0.12	0.14	0.04	0.20		0.22	0.72	0.97	0.30		0.15	0.87	0.37

Source: Wisconsin Department Of Transportation - Bureau of Transit, Local Roads, Railroads, and Harbors

Table 7-6. Wisconsin small urban/rural bus systems- Menominee peer group 2010												
---	Menominee	Oneida	Adams Co.	Bay Area Rural Transit (BART)	Dunn Co.	Rusk Co./Ladysmith	Manitowoc	Merrill	Monona	Sauk Co.	Sawyer Co.	Stevens Pt.	Average
Revenue Hours	27,950	22,606	3,960	23,852	11,350	10,828	30,108	7,416	4,371	3,242	22,896	21,394	15,831
Ridership	78,170	45,478	3,516	91,735	34,451	27,477	282,851	70,903	21,191	3,338	58,164	238,220	79,625
Revenue Miles	686,101	353,248	91,241	515,810	154,050	159,863	477,338	73,098	55,580	52,859	440,922	270,533	277,554
Total Operating Costs	$1,447,092	$856,178	$140,028	$1,091,180	$431,544	$497,620	$2,072,965	$495,437	$175,396	$165,249	$1,312,707	$1,420,104	$842,125
Operating Costs per revenue hour	$51.77	$37.87	$35.36	$45.75	$38.02	$45.96	$68.85	$66.81	$40.13	$50.97	$57.33	$66.38	$50.43
Operating Costs per passenger	$18.51	$18.83	$39.83	$11.89	$12.53	$18.11	$7.33	$6.99	$8.28	$49.51	$22.57	$5.96	$18.36
Operating Costs per mile	$2.11	$2.42	$1.53	$2.12	$2.80	$3.11	$4.34	$6.78	$3.16	$3.13	$2.98	$5.25	$3.31
Passengers per hour	2.80	2.01	0.89	3.85	3.04	2.54	9.39	9.56	4.85	1.03	2.54	11.13	4.47
Passengers per mile	0.11	0.13	0.04	0.18	0.22	0.17	0.59	0.97	0.38	0.06	0.13	0.88	0.32

Source: Wisconsin Department Of Transportation - Bureau of Transit, Local Roads, Railroads, and Harbors

Table 7-7. Wisconsin small urban/rural bus systems- Menominee peer group 2011													
	Menominee	Oneida	Adams Co.	Bay Area Rural Transit (BART)	Dunn Co.	Rusk Co./ Ladysmith	Manitowoc	Merrill	Monona	Sauk Co.	Sawyer Co.	Stevens Pt.	Average
Revenue Hours	45,900	26,393	3,960	24,742	10,224	12,229	32,274	7,038	4,363	5,616	38,981	21,271	19,416
Ridership	145,267	47,755	4,323	106,127	30,608	35,105	313,794	72,566	19,835	3,605	92,585	267,901	94,956
Revenue Miles	1,055,858	356,477	95,850	522,060	139,226	159,371	504,566	77,947	54,507	76,114	854,158	271,721	347,321
Total Operating Costs	$2,195,450	$983,506	$139,083	$1,121,954	$519,597	$535,484	$2,141,143	$529,240	$183,648	$237,440	$1,850,654	$1,389,713	$985,576
Operating Costs per revenue hour	$47.83	$37.26	$35.12	$45.35	$50.82	$43.79	$66.34	$75.20	$42.09	$42.28	$47.48	$65.33	$49.91
Operating Costs per passenger	$15.11	$20.59	$32.17	$10.57	$16.98	$15.25	$6.82	$7.29	$9.26	$65.86	$19.99	$5.19	$18.76
Operating Costs per mile	$2.08	$2.76	$1.45	$2.15	$3.73	$3.36	$4.24	$6.79	$3.37	$3.12	$2.17	$5.11	$3.36
Passengers per hour	3.16	1.81	1.09	4.29	2.99	2.87	9.72	10.31	4.55	0.64	2.38	12.59	4.70
Passengers per mile	0.14	0.13	0.05	0.20	0.22	0.22	0.62	0.93	0.36	0.05	0.11	0.99	0.33

Source: Wisconsin Department Of Transportation - Bureau of Transit, Local Roads, Railroads, and Harbors

2008 MENOMINEE COUNTY/TRIBE SPECIALIZED TRANSPORTATION COORDINATION ACTION PLAN

The 2008 Menominee County/Tribe Specialized Transportation Coordination Action Plan was developed to meet Federal SAFETEA-LU. SAFETEA-LU notes that any municipality that wants to pursue Job Access and Reverse Commute (JARC), New Freedom or transit capital (5310) funding must have a transportation coordination plan in place. The State of Wisconsin (administered through the DOT) designated the county as the responsible party for the development of the specialized transportation coordination plans. ECWRPC was perfectly positioned to facilitate the development of the county level plan.

The specialized transportation coordination plan evaluates the transportation system and identifies the strengths, weaknesses/limitations, opportunities, threats, responsible parties, timeframe and priorities.

For the purposes of evaluating the transportation system; the high priority services needs and gaps from the 2008 Menominee County/Tribe specialized Transportation Coordination Action Plan are displayed in **Table 7-8.**

Table 7-8. 2008 Menominee County/Tribe Specialized Transportation Coordination Action Plan, High Priority Service Needs and Gaps	
Service Needs and Gaps	**Priority Level**
Hard to get funding for local match on grants	1 (Very high)
Putting someone who is a student (High school or college representative), elderly, or has a disability person on the committee	2 (Committee – Very high, WisDOT Tribal Task Force – High)
No weekend, Sunday service or evening service (i.e. hard for students taking night classes at the college); no service provided for special events or for events outside the county (i.e. Shawano County Fair)	3 (Develop partnerships – Very high, Sustaining – High, Applying for other grants – High-medium)
South Branch area would be nice to provide more public transportation service there	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Weekend and evening service is not provided	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Continue to look at partnerships to get additional funding or to pool money together	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Working with the college to provide transportation to and from the college campus all classes, but evening classes in particular	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Partnership with the casinos for employees and customers	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Provide public transportation for elders for other tribal events/meetings around the state	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Coordination between the public transportation system in Menominee and the Shawano County system; establish partnerships with the Community Action Board, University of Wisconsin	4 (Develop partnerships – Very high, Applying for other grants – High-medium)

Continue forming partnerships	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Continue forming partnerships	4 (Develop partnerships – Very high, Applying for other grants – High-medium)
Improved bus stops shelters and transfer points; demand is high for public transportation at the peak hours; may turn people away during the day because there may not be another vehicle available; have waiting lists for the peak hours (6am-8am and 2:30pm-5pm)	5 (High)
No volunteer drivers – compensation for drivers is an issue	5 (High)
Attend meetings to ensure that the transit system is represented and available for questions	5 (High)
Put drivers through some behavior and communication training, AED training	5 (High)
Examine whether or not the provision of service are being done in the most cost-effective manner	5 (High)
Fixed routes and additional coordination	6 (Medium to High)

MENOMINEE COUNTY COMPREHENSIVE PLAN, 2030

The Menominee County Comprehensive Plan, 2030 was put together by ECWRPC and adopted December 17, 2009. The plan identifies a transportation framework plan from which a list of goal, strategies and recommendations are listed to achieve the overall transportation vision.

The Transportation Vision Statement

In 2030, Town/County residents have access to a network of well-maintained local roads, county and state highways that address the needs for mobility for all persons and the movement of freight. A comprehensive public transportation system is available and has filled the needs of county residents. Networks of walking and biking trails have been established in the county.

The Transportation Goals, Strategies and Recommendations:

GOAL 1:

Ensure that the county and local transportation system is well maintained and safe.

Strategy 1
Work with the WisDOT and Menominee Indian Tribe of Wisconsin to address safety concerns on STH 47/55 between the Shawano/Menominee County line and CTH VV.

Recommendations 1.1 - Assist in the implementation of recommendations included in the Traffic Impact Analysis study that has recently been completed. The study looked at the area from Duquaine Road south to the Shawano County line. Items to be addressed should include:
- Corridor movement (vehicle/bike/pedestrian entering/exiting);
- Speed; and
- Turning movements.

Recommendations 1.2 - Address safety concerns at the Keshena Primary School by initiating a "Safe Routes to School" program that will deal with safety concerns and encourage more children to safely walk and bike to school. Contact ECWRPC for more information.

Recommendations 1.3 - Address safety concerns at the Casino and High School through the addition of a left turn lane/through lane for northbound traffic.

Recommendations 1.4 - Address highway safety concerns at the College of Menominee Nation.

Recommendations 1.5 - Work with the WisDOT to install flashing lights before the 45 mph speed limit sign as a way to increase signage visibility.

Recommendations 1.6 - Continue to work with the WisDOT to increase safety at the STH 47/55 and CTH VV intersection. Items to be investigated should include:
- Turning movements; and
- Flooding.

Strategy 2
Address safety concerns at the STH 55/CTH M (east) and STH 47 and CTH G (Shawano County) intersections.

Recommendations 2.1 - Continue to work with WisDOT to correct reduced visibility at the intersection of STH 55 and CTH M due to terrain (hills) and a poor vision corner.

Recommendations 2.2 - Continue to support efforts between Shawano County and WisDOT to address safety concerns at the STH 47 and CTH G (Shawano County) intersection.

Strategy 3
Ensure that local children have the ability to safely walk and bike to the Menominee Indian Middle School in Neopit.

Recommendations 3.1 - Initiate a "Safe Routes to School" program that will encourage more children to safely walk and bike to school. While safety issues have not been identified at this school, it is important to ensure the safety of area children.

Strategy 4
Continue to work with the Menominee Indian Tribe of Wisconsin to ensure that the local transportation system is well maintained and safe.

Recommendations 4.1 - Continue to work with the Menominee Indian Tribe of Wisconsin on construction agreements that benefit both Tribal and county roads. Ensure that these roads

have been identified in the Transportation Improvement Program (TIP) for the Menominee Indian Tribe of Wisconsin.

Recommendations 4.2 - Work with the Menominee Indian Tribe of Wisconsin to establish a long range transportation plan of proposed projects that encompasses a five year timeline. Utilize this plan to secure federal and state funding for upcoming projects.

Strategy 5
Timely respond to site-specific road maintenance and/ or safety issues.

Recommendations 5.1 - Continue to conduct PASER evaluation of the existing road network.

Recommendations 5.2 - Continue to use a five year Capital Improvement Plan (CIP) Program to establish appropriate funding levels.

Recommendations 5.3 - Develop criteria that can be used to assess and determine timing for the paving of gravel roads. There are currently about 82 miles of town roads. Since it is not feasible or possible to pave all roads at this time, an evaluation system should be developed that can be used to determine need.

Strategy 6
The County highway and sheriff's department should work with its Tribal counterparts to identify dangerous intersections and roadways within the County/Reservation. Currently the Tribal Police only report accidents that involve fatalities to the state. Therefore it is difficult to identify dangerous intersections or road sections.

Recommendations 6.1 - Continue to work with WisDOT to establish a method of reporting accidents, no matter how minor, so that an internal tracking system can be established. Accident information should be shared between the County and the Menominee Indian Tribe of Wisconsin.

Recommendations 6.2 - The County Highway and Tribal Road Committee should develop a rating system that can be used to identify the most dangerous areas/intersections in the County/Reservation and a method to correct these areas.

Strategy 7
Ensure that the road network operates as an efficient system. Roads that receive the highest level of use and have a functional classification area eligible for federal funding for maintenance and construction.

Recommendations 7.1 - Review and revise the road classification system as needed so that the most important roads are eligible for federal funding.

Recommendations 7.2 - Work with WisDOT to plan for and implement improvements along STH 47 that will improve freight, vehicular, pedestrian movement through this corridor.

GOAL 2:

Provide a diversity of affordable transportation options for all age and income groups.

Strategy 1
Continue to work with Menominee Public Transportation to provide public transportation to all residents of the County and Menominee Indian Tribe of Wisconsin.

Recommendations 1.1 - Assess current transportation programs and needs for elderly and disabled residents and Tribal members.

Strategy 2
Ensure that residents have access to County and Tribal services. Population centers within the county are concentrated in the unincorporated communities of Keshena, Neopit, Zoar, Middle Village (Shawano County), South Branch and the lakes area in the southeast corner of the county. County and Tribal services are currently found in the unincorporated community of Keshena. In the future additional Tribal services may be available in Middle Village (Shawano County).

Recommendations 2.1 - Monitor population locations in regard to services and ensure that public transportation provides a link between the residents and services.

Strategy 3
Address medical transportation needs for County and Tribal veterans.

Recommendations 3.1 - Work with Menominee Public Transportation to identify funding sources that can be used to transport veterans to medical appointments in Appleton, Iron Mountain and Milwaukee.

GOAL 3:

Encourage the expansion and safety of non-motorized transportation and transportation opportunities. Bicycling and walking are important modes of transportation and area used for commuting to school and work, social interaction, recreation and exercise. For some people, such as children and households with no car or driver, this is the primary means of transportation. Bicycling and walking have health benefits, move people inexpensively, reduce congestion and air pollution. The availability of sidewalks near schools may also reduce the need for busing students within walking distance.

Strategy 1
Accommodate bicyclists and pedestrians in areas of high activity or concentrated development. People may be more willing to walk or bike if using these modes can be done safely and conveniently.

Recommendations 1.1 - Ensure that any upgrades to STH 47/55 between CTH VV and the College of Menominee Nation incorporate pedestrian (sidewalk) and bicycling facilities.

Recommendations 1.2 - Make the installation of sidewalks a priority, in the unincorporated communities of Keshena and Neopit, along major streets to important destinations such as schools, casino, library, Woodland Bowl, etc.

Recommendations 1.3 - Place a priority on the long-term installation of pedestrian and bicycling facilities between Keshena and Middle Village.

Strategy 2
Consider establishing bicycle, pedestrian, and other non-motorized recreational trails.

Recommendations 2.1 - Consider establishing a recreational trail between the lakes area in the southeast corner of the county and the unincorporated community of Keshena.

Recommendations 2.2 - Consider establishing a recreational trail that would connect to the state bike system in Shawano County.

Recommendations 2.3 - Consider establishing a recreational trail system around the Legend Lake system.

Strategy 3
Address All Terrain Vehicle (ATV) use in the County. ATV's have wide spread use within Menominee County. To establish a safe location for vehicle rider-ship and to address erosion and other maintenance issues, the Town/County along with the Menominee Indian Tribe of Wisconsin should work together to establish an ATV trail system.

Recommendations 3.1 - Establish a committee comprised of County, Town, Tribal and citizen representatives to address the issue of ATV use in the County. The committee should look at:
- Existing ATV use in the County;
- Locations of potential ATV trail development; and
- Funding mechanisms for construction, maintenance and enforcement.

Recommendations 3.2 - Consider expanding the ATV trail system along CTH VV to the Trailer Court.

GOAL 4:

Incorporate sustainable and environmentally friendly principals in the daily maintenance and operation of the transportation system.

Strategy 1
Explore and incorporate sustainable and environmentally friendly principles in highway maintenance programs.

Recommendations 1.1 - Continue to work with the Menominee Indian Tribe of Wisconsin to control the spread of invasive species along highway right-of-ways utilizing environmentally friendly practices. Currently the highway department steam cleans the exterior of equipment to control the spread of invasive species.

Recommendations 1.2 - Continue to reduce fossil fuel use in the maintenance of roadside ditches. Currently County practices include:
- Reduction in number of times ditches are mowed per year.
- Utilization of mechanical means to control weeds.

Recommendations 1.3 - Explore the availability of alternative fuels for County vehicles. Alternative fuels could include the use of biodiesel fuels.

GOAL 5:

Explore opportunities for transportation related tourism opportunities.

Strategy 1
Work cooperatively with the Menominee Indian Tribe of Wisconsin to identify opportunities for improved tourism business and amenity development that will not compromise the environment.

Recommendations 1.1 - Work with the Menominee Indian Tribe of Wisconsin Tourism Department to develop an auto tour along STH 55 that would highlight existing amenities.

CRASH DATA ANALYSIS

Crash data for the seven years from 2005-2011 was obtained from the WisDOT Wisconsin Traffic Operations and Safety (TOPS) laboratory crash database and compiled in **Table 7-9**. It is important to note that MITW is not required to submit data to WisDOT, therefore crash totals may be incomplete. A total of 168 crashes were recorded within Menominee County from 2005 to 2011. There were 65 total crashes on STH 47 and 52 total crashes on STH 55. The majority of crashes, 82.7 percent, took place midblock rather than at intersections. CTH VV had a total of 19 crashes and CTH M had 10, while CTH AA and CTH WW had only one each. Local streets had a total of 16 crashes. Throughout the six years there was a total of 4 fatality crashes, 55 injured crashes and 105 crashes with property damage only. Further analysis on each road is discussed below.

Table 7-9. Menominee County Crash Summary, 2005-2011							
			Accident Location		Accident Severity		
Road	Total Crash	# of vehicles involved	Inter-section	Mid-block	Fatality	Injured	Property Damage Only
STH 47	65	90	8	57	1	23	41
STH 55	52	57	3	49	1	18	33
CTH AA	1	1	0	1	1	0	0
CTH M	10	11	4	6	1	1	8
CTH VV	19	22	5	14	0	9	10
CTH WW	1	1	0	1	0	0	1
Local Streets	16	23	5	11	0	4	2
Total	**168**	**205**	**25**	**139**	**4**	**55**	**105**

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

7-18

An evaluation of all the major roadways within MITW Reservation was conducted, including a crash breakdown and a crash rate analysis. Crash breakdowns were compiled for the entire length of corridor within the MITW Reservation. To determine the crash rate, each corridor was split into segments based on major intersections. The most recent recorded AADT was used in the calculation. If there was more than one AADT recorded, the AADT closest to the accident sites was selected. Crash rates for intersections were not calculated because of lack of traffic data available. Crash locations can be found on **Exhibit 7-3**.

For comparison purposes, **Table 7-10**. depicts 5 year (2006 to 2010) crash, fatality, injury and property damage rate averages per 100 million vehicle miles (MVM) traveled for the State of Wisconsin. The State had a crash rate on rural state trunk highways (STH) that ranges from 70 to 165 and an injury rate that ranges from 26 to 69 per 100 MVM traveled depending on the average daily traffic (ADT). The State crash rate for urban streets is 291 with an injury rate of 86.2 per 100 MVM traveled and the crash rate on the county trunks is 138 with an injury rate of 53.2 per 100 MVM traveled.

The injury rate is broken out into three categories for further analysis:

- Type A: Incapacitating Injury - Any injury other than a fatal injury, which prevents the injured person from walking, driving, or from performing other activities, which he/she performed before the accident.
- Type B: Non-incapacitating Injury - Any injury, other than fatal or incapacitating, which is evident at the scene. Evidence of injury may include known symptoms of an injury, which are not directly observable.
- Type C: Possible Injury - Any injury which is not observable or evident at the scene but is claimed by the individual or suspected by the law enforcement officer.

For more detail on 2006-2010 State crash rates see **Appendix D-1**.

Table 7-10. State of Wisconsin Crash Rates (5 year average 2006-2010) Crashes Per 100 MVM Traveled							
Road Classification	Crash Rate	Fatality Rate	Injury	A	B	C	Property Damage Only
Rural State STH ADT between 3500 and 8700 ADT	70	1.3	26.9	5.3	10.6	11.0	41.7
Rural STH ADT between 2000 and 3500 ADT	81	1.5	31	5.9	12.8	12.3	48.4
Rural STH ADT between 750 and 2000 ADT	105	1.8	40.3	7.7	17.3	15.3	63.2
Rural STH ADT less than 750	165	3.2	68.6	14.3	30.8	23.5	92.9
Urban Streets	291	0.62	86.2	6.26	28.2	51.8	204.4
County Trunks	138	1.8	53.2	9.24	22	21.8	83.2

*Excludes Deer Crashes
* The rates do not include non-reportable crashes.
* All crashes that occurred on urban city streets, rural city streets, and urban county highways have been combined into a single category called "Urban Streets." In past years, the "Urban Streets" category also included Urban State Trunk Highways. All crash rates in the "Urban Streets" category have been recalculated based on the new definition and do not match the "Urban Streets" crash rates provided in previous years (prior to 2009).
Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

STH 47

STH 47 is a minor arterial with 650-6300 AADT counts noted in 2009. The highest AADT counts were taken around Keshena, where STH 47 shares with STH 55. The lowest AADT count was taken six miles west of Neopit. There were a total of 65 crashes along STH 47 from the Menominee/Langlade County line to the Menominee/Shawano County line. Deer crashes (18) and vehicle in transit (22) crashes were the highest accident types. **Table 7-11.** depicts STH 47 crash breakdown from 2005 to 2011.

Table 7-11. STH 47 Crash Breakdown, 2005-2011	
Accident Type	**Number of Crashes**
Deer	18
Ditch	7
Traffic Sign	2
Tree	4
Pedestrian	2
Overturned	6
Other Object	1
Blank (Vehicle in Transit)	22
Guardrail	2
Other object not fixed	1
Total	**65**

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

The STH 47 corridor was broken out into three segments for the crash analysis (**Table 7-12**). STH 47 from Menominee/Langlade County line to CTH M had a crash rate 72.5 per 100 MVM traveled and an injury rate of 20.6 per 100 MVM traveled. STH 47 from CTH M to STH 55 had a crash rate of 23.7 per 100 MVM traveled and an injury rate of 2.1 per 100 MVM traveled. STH 47 from STH 55 to Menominee/Shawano County line, also called STH 55, is in the Keshena area had a crash rate of 23.0 per 100 MVM traveled and an injury rate of 12.0 per 100 MVM traveled. In all cases the crash and injury rate for STH 47 is less than their respective counter parts at the State. Fatality rates were at zero because no fatalities were reported along the segments.

Table 7-12. STH 47 Crash Analysis, 2005-2011 Crashes Per 100 MVM Traveled			
Segment	**Crash Rate**	**Crash Rate (w/o Deer accidents)**	**Injury Rate**
Menominee/Langlade County Line (West) to CTH M	72.5	51.5	20.6
CTH M to STH 55	23.72	12.37	2.06
STH 55 to Menominee/ Shawano County Line (South)	23.03	21.02	12.01

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

STH 55

STH 55 is a minor arterial that splits off of STH 47 northwest of Keshena and continues north into Langlade County. An AADT count of 790 was taken in 2009 south of CTH M East, which is slightly higher than 2005 (AADT count 670) and slightly lower than 2002 (AADT count 810). An AADT count of 740 was taken on STH 55 between CTH M East and CTH M West, which is similar to the 2002 AADT count of 740. Ditch (21) and tree (15) crashes were the highest accident type. Road alignment should be further evaluated to determine if potential cause of crashes. **Table 7-13**. depicts STH 55 crash breakdown from 2005 to 2011.

| Table 7-13. STH 55 Crash Breakdown, 2005-2011 ||
Accident Type	Number of Crashes
Deer	6
Ditch	21
Traffic Sign	3
Tree	15
Overturned	4
Blank (Vehicle in Transit)	6
Guardrail	3
Other Non-collision	1
Other Animal	2
Total	**61**

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

STH 55 corridor was broken out into two segments for the crash analysis (**Table 7-14**). STH 55 from Menominee/Langlade County line to CTH M had a crash rate 130.7 and an injury rate of 53.1 per 100 MVM traveled. STH 55 from CTH M to STH 47/55 had a crash rate of 65.4 and an injury rate of 18.7 per 100 MVM traveled. The Rural STH with ADT less than 750 had a crash rate of 165, an injury rate of 68.6 and a fatality rate of 3.2 per 100 MVM traveled. STH 55 from Menominee/Langlade County line to CTH M crash rate is slightly lower than the State equivalent STH, the injury rate is slightly higher and the fatality rate is considerably higher. Based off of the crash breakdown and rates, alignment should be further evaluated to determine if potential cause of higher number of accidents.

| Table 7-14. STH 55 Crash Analysis, 2005-2011 Crashes Per 100 MVM Traveled ||||
Segment	Crash Rate	Crash Rate (w/o Deer accidents)	Injury Rate
Langlade County Line (North) to CTH M	130.67	126.59	53.08
CTH M to STH 47/55	65.4	49.83	18.69

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH AA

CTH AA is located in the South Branch area of the county. It runs north from CTH M to Fredenberg Lake. North of Fredenberg Lake, it turns east into Oconto County, intersecting STH 32 in Breed. In 2002, an AADT count of 330 was noted north of CTH M and in 2009 200 was noted. There was only one total crashes reported from 2005 to 2011. **Table 7-15**. depicts CTH AA crash breakdown from 2005 to 2011.

| Table 7-15. CTH AA Crash Breakdown, 2005-2011 ||
Accident Type	Number of Crashes
Tree	1

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH AA corridor crash analysis is depicted in (**Table 7-16**). CTH AA from CTH M to Menominee/Oconto County had a crash rate of 15.8 per 100 MVM traveled. CTH AA crash rate was lower than the State CTH average from 2006 to 2010.

Table 7-16. CTH AA Crash Analysis, 2005-2011 Crashes Per 100 MVM Traveled			
Segment	Crash Rate	Crash Rate (w/o Deer accidents)	Injury Rate
CTH M to Menominee/Oconto County Line (East)	15.75	15.75	0

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH M

CTH M provides for east/west travel route between Oconto County and Neopit. AADT counts for this highway are from 2002 and 2009. An AADT count of 710 was taken East of STH 55 in 2002 and in 2009 the AADT count was 506. Another AADT count was taken north of Neopit; the 2002 AADT count was 510 and 2009 AADT count was 170. An AADT count of 390 was noted in 2002 and 340 in 2009 on CTH M East of CTH AA. In all case AADT counts have decreased from 2002 to 2009. Tree, with 4 crashes, was the highest accident type. **Table 7-17**. depicts STH 55 crash breakdown from 2005 to 2011.

| Table 7-17. CTH M Crash Breakdown, 2005-2011 ||
Accident Type	Number of Crashes
Blank (Vehicle in Transit)	1
Deer	2
Ditch	1
Overturned	1
Traffic Sign	2
Tree	4
Total	**10**

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH M corridor was broken out into three segments for the crash analysis (**Table 7-18**). CTH M from STH 47 to STH 55 had a crash rate of 11.3 and injury rate of zero per 100 MVM traveled. CTH M from STH 55 to CTH AA had a crash rate of 73.5 and an injury rate of 14.7 per 100 MVM traveled. CTH M from CTH AA to Menominee/Oconto County line had a crash rate of 58.1 and an injury rate of zero per 100 MVM traveled. In all cases CTH M crash rates were lower than the State CTH average from 2006 to 2010.

Table 7-18. CTH M Crash Analysis, 2005-2011 Crashes Per 100 MVM Traveled			
Segment	Crash Rate	Crash Rate (w/o Deer accidents)	Injury Rate
STH 47 to STH 55	11.3	11.3	0
STH 55 to CTH AA	73.46	73.46	14.69
CTH AA to Menominee/Oconto County Line (East)	58.05	19.35	0

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH VV

CTH VV runs in the southern portion of the MITW Reservation from STH 47/55 through the lake area to Oconto County. It provides access from the east (Cecil - via CTH R) and the west (Keshena) to the Lake area. An AADT count was taken on CTH VV east of the intersection of STH 47/55; the AADT count in 2002 was 3,200 and in 2009 it was 2,500. Ditch (6) was the highest accident type. **Table 7-19**. depicts CTH VV crash breakdown from 2005 to 2011.

Table 7-19. CTH VV Crash Breakdown, 2005-2011	
Accident Type	Number of Crashes
Deer	2
Ditch	6
Tree	3
Overturned	1
Other Object	2
Culvert	1
Other Post	1
Blank (Vehicle in Transit)	3
Total	**19**

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH VV corridor was broken out into two segments for the crash analysis (**Table 7-20**). CTH VV from Menominee/Shawano County line to STH 47/55 had a crash rate of 16.7 per 100 MVM traveled. CTH VV from STH 47/55 to Menominee/Oconto County line had a crash rate of 21.5

and an injury rate of 10.2 per 100 MVM traveled. In all cases CTH M crash rates were lower than the State CTH average from 2006 to 2010.

Table 7-20. CTH VV/VVW Crash Analysis, 2005-2011 Crashes Per 100 MVM Traveled			
Segment	Crash Rate	Crash Rate (w/o Deer accidents)	Injury Rate
Menominee/Shawano County Line (West) to STH 47/55	16.66	8.33	0
STH 47/55 to Menominee/Oconto County Line (East)	21.53	19.26	10.2

Source: The University of Wisconsin-Madison Traffic Operations and Safety Laboratory (UW TOPS Lab) database

CTH WW

CTH WW is an east west route that connects CTH M to STH 55. There was only one total crash reported from 2005 to 2011. **Table 7-21**. depicts CTH WW crash breakdown from 2005 to 2011. Crash rates could not be calculated because no traffic count data was available.

Table 7-21. CTH WW Crash Breakdown, 2005-2011	
Accident Type	Number of Crashes
Tree	1

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

Local Streets

Local roads provide access to adjacent land and provide for travel over relatively short distances. All roads not classified as arterials or collectors are local. These roads provide access to residential, recreational, commercial, and industrial uses within the area. MITW Reservation has a significant amount of local function roads concentrated around the Legend Lake area to the east of Keshena. The highest accident is vehicles in transit with 5. **Table 7-22**. depicts the local roads crash breakdown from 2005 to 2011.

Table 7-22. Local Streets, 2005-2011	
Accident Type	Number of Crashes
Deer	2
Ditch	2
Traffic Sign	1
Tree	3
Pedestrian	0
Overturned	0
Other Object	0
Culvert	0
Blank (Vehicle in Transit)	5
Other object not fixed	1
Other Roadway	1
Bridge Rail	0
Parked Vehicle	1
Total	**16**

Source: The University of Wisconsin-Madison, Traffic Operations and Safety Laboratory (UW TOPS Lab) database

Crash Summary

Table 7-23 splits the crash data out by year for each corridor evaluated. **Table 7-24** and **Table 7-25** splits the crash data out by year, by accident type and by severity.

Table 7-23. Menominee County Yearly Crash Summary (By Street)								
Highway/Street	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**Total**
STH 47	13	10	13	5	7	12	5	**65**
STH 55	13	10	6	11	3	8	1	**52**
CTH AA	1	0	0	0	0	0	0	**1**
CTH M	2	3	1	3	0	0	1	**10**
CTH VV	5	3	4	4	1	2	0	**19**
CTH WW	0	0	1	0	0	0	0	**1**
Local Streets	2	4	2	1	3	1	3	**16**
Total	**36**	**30**	**27**	**24**	**14**	**23**	**10**	

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

Table 7-24. Menominee County Yearly Crash Summary (By Accident Type)								
Accident Type	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**Total**
Animal (Deer, Other Animal)	7	3	6	4	2	7	3	**32**
Blank (Vehicle In Transit)	9	7	4	4	3	4	4	**35**
Culvert	0	0	1	0	0	0	0	**1**
Ditch	5	5	8	8	3	4	0	**33**
Fixed Object Off Road (Bridge Rail, Guardrail, Up Pole, Other Post, Traffic Sign)	0	9	0	1	1	3	0	**14**
Other (Other Object Not Fixed, Other Roadway, Other Non-collision, Other Object)	0	0	2	1	1	2	1	**7**
Overturned	2	1	4	1	2	1	1	**12**
Parked Vehicle	0	1	0	0	0	0	0	**1**
Pedestrian	0	0	0	0	1	1	0	**2**
Tree	13	4	2	5	1	1	1	**27**
Total	**36**	**30**	**27**	**24**	**14**	**23**	**10**	**164**

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

Table 7-25. Menominee County Yearly Crash Summary (By Severity)								
Severity	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**Total**
Fatality	2	1	0	0	1	0	0	**4**
Injury	12	10	4	8	5	7	0	**46**
Property Damage	20	18	19	15	5	14	9	**100**
Total	**34**	**29**	**23**	**23**	**11**	**21**	**9**	**150**

Source: The University of Wisconsin-Madison
Traffic Operations and Safety Laboratory (UW TOPS Lab) database

Overall, crash data for all segments are below the respective State crash, injury and fatality rate average (2006 to 2010) except for STH 55 from Langlade County Line (North) to CTH M, which had higher injury and fatality rates. This particular section also had high total crashes related to vehicle running off into a ditch (33) or a tree (27). It is recommended that this segment be further evaluated to determine reasons for crashes.

ROAD SAFETY AUDIT

The Menominee Road Safety Audit (RSA) was conducted by Opus International Consultants Inc. in 2009, who was retained by the College of Menominee Nation. The consultant was tasked with evaluating all roadways within the reservation based on operation and design. For the operational stage components, the RSA team reviewed the existing safety performance and identified safety issues at key locations with the Menominee Nation. For the design stage components, the RSA team reviewed the designs for resurfacing projects on STH 55 (STH 47 to north county line), STH 47 (west limits of Neopit to the west County/Reservation line) and a Traffic Impact Assessment for a proposed expansion of the casino in Keshena.

The Menominee RSA made the following recommendations:

TABLE 7-26. SUMMARY OF SAFETY ISSUES AND SUGGESTIONS		
SAFETY ISSUE (Number and Description)	**Risk Rating**	**Suggestions**
1. Lane Departure 1(a) Clear zone 1(b) Steep side slopes 1(c) Vehicles crossing the centerline 1(d) Shoulder edge drop-offs	**D**	*Strategies to Keep Vehicles in their Lane* • Shoulder rumble strips • Centerline rumble strips • Continuous delineation • Improve warning signs • Safety edge • Barriers in high risk areas • Flatten steep side slopes • Shoulder cable guard rail *Strategies to protect drivers and occupants once they have left their lane* • Remove objects within the clear zone
2. Signing and Delineation	**C**	• Flexible delineators • Improve curve warning signs
3. STH 55 and CTH M (west) intersection 3(a) Limited intersection sight distance 3(b) Intersection located on horizontal and vertical curves 3(c) Signing	**C**	• Improve signing • Lateral rumble strips on CTH M (west) • Improve intersection sight distance
4. STH 55 and CTH M (east) intersection 4(a) Horizontal and vertical curves limit intersection and stopping sight distance 4(b) Complex intersection layout	**C**	• Roundabout

5. STH 47 and CTH G intersection	D	• Intersection realignment • Roundabout
6. CTH VV and East County Line Road Intersection	C	• Enhance signing
7. Spirit Rock Area	C	• Provide crash test approved barrier • Enhance reflectivity of the barrier • Provide lighting
8. Speed Management	D	• Speed enforcement plan • Narrow lanes with edgelines • Gateway treatments • Permanent speed feedback signs
9. Non-motorized facilities in Keshena and Neopit	D	• Establish continuous sidewalk network • Improve pedestrian crossing
10. Access to the College of Menominee Nation	C	• Offset right turn lane on northbound STH 47/55 • Bypass lane for southbound STH 47/55
11. Access to the Casino		• Access modifications • Provide a road diet on STH 47/55 • Pedestrian improvements
12. STH 47/55 and CTH VV Intersection		• Provide "Stop Ahead" markings and signs (W3-1) on CTH VV • Provide a flashing red beacon above the stop sign on CTH VV • Provide a bump-out on the northwest corner of the intersection. • Pedestrian warning signs and crosswalks • R-3-8 modified lane use sign on northbound approach • Provide a road diet on STH 47/55 • Target arrow (W1-7) for CTH VV
13. Zoar	C	• Pedestrian facilities • Gateway treatment

MENOMINEE NATION ROAD SAFETY AUDIT, Opus International Consultants Inc., December 2009

STH 47 and CTH G intersection, safety issue number five, was submitted to the State as a relocation project for Highway Safety Improvement Program (HSIP) funding and was approved. The proposed improvement involves the relocating the STH 47 and CTH G intersection farther east along STH 47 to improve sight distance caused by horizontal and vertical curves along STH 47 to the west of the existing intersection. Safety will increase with the inclusion of a 90 degree intersection allowing motorist stopped on CTH G to see cross traffic on STH 47. Project schedule is as follows:

- 2013 – Project preliminary engineering with a total cost of $20,000.
- 2014 – Real-estate transaction with a total cost of $5,000.
- 2015 – Project construction with a total cost of $422,000.

DEMOGRAPHIC ANALYSIS

To be able to evaluate how efficient the MITW transportation system is at meeting the needs of its users; one must understand the users themselves and their trends. U.S. Census and American Community Survey (ACS) data allows us to identify deficiencies at the surface that

need to be further evaluated. When looking at Census and ACS data it is important to understand the differences between the two. Census data is a total count and ACS data is an average of a range of years that measure characteristics. Five year ACS data was selected to evaluate the MITW Reservation because it provides the greatest accuracy of the ACS data products offered (1 year, 3 year and 5 year) for smaller communities (>5000). The following is a compilation of data from the U.S. Census and ACS for Menominee County and municipalities that make up the MITW Reservation.

Population reported by the U.S. Census from 2000 to 2010 (**Table 7-27**) shows a population decline in all municipalities from 2000 to 2010. This in many ways could have to do with the struggling State and US economy effects on the Tribal economy and Tribal members moving to find work. What stands out in the data is that in general the non-driving population (age groups 0-14 and 65+) are a significant portion of the total population. In some cases, specifically in Keshena, Legend Lake and Middle Village, the 2010 population of non-drivers is more than 50% of the total population. This is important to note when looking to see what options non-driving populations have to transit and non-motorized modes.

Table 7-27. Population Age Groups 2000 to 2010								
	2000				**2010**			
Municipality	**0-14**	**15-64**	**65+**	**Total**	**0-14**	**15-64**	**65+**	**Total**
Menominee Reservation	1630	2869	414	**4913**	1220	2784	509	**4513**
Menominee County	1496	2680	386	**4562**	1129	2621	482	**4232**
Keshena	538	782	74	**1394**	427	747	88	**1262**
Legend Lake	378	955	200	**1533**	328	948	249	**1525**
Middle Village	134	189	28	**351**	91	163	27	**281**
Neopit	311	480	48	**839**	184	454	52	**690**
Zoar	50	68	6	**124**	18	70	10	**98**

Source: U.S. Census Bureau, 2000 and 2010, DP-1, SF 1

Auto Dependency

Auto dependency is reported in the ACS 5 year data (2006-2011) (**Table 7-28**), which shows the number of Menominee citizens per house hold who own vehicles to those who do not. Municipalities including Keshena, Neopit and Zoar have larger number of households who don't have access to a vehicle compared to Legend Lake and Middle Village. Further analysis is needed to ensure users in Keshena, Neopit and Zoar have adequate access to transit. It is important to note that the Coefficient Variable (CV) is high for the households with and without vehicles available. CV is a statistical measure of the dispersion of data points in a data series around the mean. Typically, data is discounted when the CV exceeds 15 percent, but this is the only 5 year data that has been released at this time.

Table 7-28. Auto Dependency Per Household, ACS 5yr (2006-2011)						
Municipality	Vehicles Available	*MOE	*CV	No Vehicles Available	*MOE	*CV
Menominee Reservation	1406	+/-172.7	7.5%	192	+/-73	23.2%
Menominee County	1332	+/-165.9	7.6%	189	+/-73	23.5%
Keshena	278	+/-71.5	15.6%	93	+/-48	31.4%
Legend Lake	611	+/-119.2	11.9%	3	+/-6	121.6%
Middle Village	74	+/-29.1	23.9%	3	+/-5	101.3%
Neopit	210	+/-89.9	26.0%	43	+/-32	45.2%
Zoar	43	+/-53	74.9%	17	+/-28	100.1%

Source: American Community Survey, 5yr 2006 to 2011, DPO4
*MOE = Margin of Error, CV = Coefficient of Variation

Employment Status

Employment status compiled from the ACS 5 year (2006-2011) data illustrates those employed and those unemployed (**Table 7-29**). There is a high percentage of un-employed compared to employed in Middle Village, Neopit and especially Zoar. Further analysis is needed to ensure adequate transportation services are available in these communities to provide opportunity to connect to local employers.

Table 7-29. Employment Status ACS 5yr (2006-2011)						
Municipality	Employed	*MOE	*CV	Un-employed	*MOE	*CV
Menominee Reservation	1487	+/-156	6.4	405	+/-98	14.7
Menominee County	1413	+/-152	6.5	384	+/-94	14.9
Keshena	333	+/-71	13.0	64	+/-48	45.6
Legend Lake	656	+/-157	14.6	163	+/-69	25.7
Middle Village	74	+/-34	27.9	21	+/-27	78.2
Neopit	188	+/-116	37.5	94	+/-54	34.9
Zoar	40	+/-50	76.0	30	+/-43	87.1

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Commuting Patterns

Commuting patterns were compiled for ACS 5 year (2006-2011) data to identify those individuals who do not utilized vehicles or transit to get to work and the mean travel time to work (**Table 7-30 to 7-35**). Keshena and Neopit have high numbers of citizens that walk to work. Further analysis is needed to see if there are adequate non-motorized facilities for MITW citizens to get to work. Legend Lake and Zoar have the highest mean travel time to work, with almost nobody walking. Further analysis is needed to see where major employers are located in comparison to Legend Lake and Zoar. **Table 7-36** represents the Menominee commuting patterns traveling to work outside the county. Menominee County in 2010 has only 68 percent of workers working within the county and 22 percent commuting outside the county. It is apparent that a significant number of workers have to travel outside the county to get work.

Table 7-30. Commuting Patterns (Menominee County) ACS 5yr (2006-2011)			
Patterns	**Number Participants**	***MOE**	***CV**
Workers 16 +	1,347	+/-155	7.0
Car, Truck, Van Drove Alone	1,007	+/-126	7.6
Car, Truck, Van Carpooled	183	+/-90	29.9
Public Transportation	14	+/-16	69.5
Walked	62	+/-58	56.9
Other Means	29	+/-32	67.1
Worked at Home	52	+/-49	57.3
Mean Travel Time to Work (minutes)	25.0	+/-3.4	8.3

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Table 7-31. Commuting Patterns (Keshena) ACS 5yr (2006-2011)			
Patterns	**Number Participants**	***MOE**	***CV**
Workers 16 +	299	+/-79	16.1
Car, Truck, Van Drove Alone	231	+/-76	20.0
Car, Truck, Van Carpooled	9	+/-10	67.5
Public Transportation	8	+/-10	76.0
Walked	24	+/-27	68.4
Other Means	22	+/-29	80.1
Worked at Home	5	+/-9	109.4
Mean Travel Time to Work (minutes)	12.1	+/-5.2	26.1

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Table 7-32. Commuting Patterns (Legend Lake) ACS 5yr (2006-2011)			
Patterns	**Number Participants**	***MOE**	***CV**
Workers 16 +	659	+/-156	14.4
Car, Truck, Van Drove Alone	497	+/-122	14.9
Car, Truck, Van Carpooled	114	+/-77	41.1
Public Transportation	0	+/-99	0
Walked	0	+/-99	0
Other Means	7	+/-12	104.2
Worked at Home	41	+/-50	74.1
Mean Travel Time to Work (minutes)	32.8	+/-5.7	10.6

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Table 7-33. Commuting Patterns (Middle Village) ACS 5yr (2006-2011)			
Patterns	**Number Participants**	***MOE**	***CV**
Workers 16 +	74	+/-34	27.9
Car, Truck, Van Drove Alone	51	+/-29	34.6
Car, Truck, Van Carpooled	16	+/-16	60.8
Public Transportation	0	+/-99	0
Walked	7	+/-10	86.8
Other Means	0	+/-99	0
Worked at Home	0	+/-99	0
Mean Travel Time to Work (minutes)	12.5	+/-2.6	12.6

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Table 7-34. Commuting Patterns (Neopit) ACS 5yr (2006-2011)			
Patterns	**Number Participants**	***MOE**	***CV**
Workers 16 +	169	+/-112	40.3
Car, Truck, Van Drove Alone	88	+/-57	39.4
Car, Truck, Van Carpooled	45	+/-37	50.0
Public Transportation	0	+/-99	0
Walked	36	+/-55	92.9
Other Means	0	+/-99	0
Worked at Home	0	+/-99	0
Mean Travel Time to Work (minutes)	11.7	+/-5.4	28.1

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Table 7-35. Commuting Patterns (Zoar) ACS 5yr (2006-2011)			
Patterns	**Number Participants**	***MOE**	***CV**
Workers 16 +	40	+/-50	76.0
Car, Truck, Van Drove Alone	25	+/-29	70.5
Car, Truck, Van Carpooled	15	+/-24	97.3
Public Transportation	0	+/-99	0
Walked	0	+/-99	0
Other Means	0	+/-99	0
Worked at Home	0	+/-99	0
Mean Travel Time to Work (minutes)	31.9	+/-18.9	36.0

Source: American Community Survey, 5yr 2006 to 2011, DPO3
*MOE = Margin of Error, CV = Coefficient of Variation

Table 7-36. 2010 Menominee County Worker Commuting Pattern		
County	**Workers**	**Percentage**
Menominee	974	68.0%
Shawano	109	7.6%
Brown	81	5.7%
Milwaukee	33	2.3%
Outagamie	30	2.1%
Dane	27	1.9%
Waukesha	23	1.6%
Oconto	18	1.3%
Winnebago	10	0.7%
Waupaca	9	0.6%
All Other Locations	118	8.2%
Total	**1,432**	**100.0%**

Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics
(Beginning of Quarter Employment, 2nd Quarter of 2002-2010).

Group Quarters

Group quarters represent populations who live in retirement facilities, nursing homes, college dormitories, military barracks, prisons and jails. People who live in these kinds of facilities often don't have access to a vehicle and depend on other modes of transportation for their transportation needs. **Table 7-37**. illustrates the number of people living in group quarters from 2000 to 2010. Keshena, Middle Village and Neopit have higher number of people living in group quarters. Further analysis needs to be done to determine what facilities these people are living in and do the they have adequate access to transportation.

Table 7-37. Number of People Living in Group Quarters, 2000 to 2010		
Municipality	**2000**	**2010**
Menominee Reservation	80	58
Menominee County	52	43
Keshena	36	43
Legend Lake	0	0
Middle Village	28	15
Neopit	15	16
Zoar	0	0

Source: U.S. Census Bureau, 2000 and 2010

SYSTEM ANALYSIS SUMMARY

- The structurally compromised roads or the "poor" category (PASER 1, 2, 3 and 4) have decreased over time, which means that the Menominee County/Towns are reconstructing a number of its roads on an annual basis to keep up with those roads deteriorating from the "fair" category (PASER 5, 6 and 7). The "fair" category has increased over time, which means that the "good" category (PASER 8, 9, and 10) are deteriorating faster than the County/Town can keep up with. This could be due to lack of funds or choice of treatments.

- It is apparent from looking at the SCI scores for the paved roads and unpaved roads that the system has been maintained on a regular basis. It is important for the Tribe to try to preserve the good paved and unpaved roads with proper preventative measure to maximize the life of the roads. The MITW should continue to utilize SCI data to evaluate their roads over time and to ensure they are using the most efficient treatments available. It is recommended that an evaluation of funding options and choices of pavement treatments take place to determine if MITW is receiving adequate funding and using the most cost effective pavement treatments.

- Menominee Department of Transit Services Transit Development Plan recommendations:
  - Reconfigure current transit service to add fixed routes with fixed schedules.
  - Seek more partners for coordination for transit service.
  - Provide more training to transit staff in area of customer services.
  - Improve marketing and image of Menominee Transit.
  - Increase transit services to out of county destinations.

- Continue to monitor Menominee Transit data to ensure that Menominee Transit is meeting their performance measure goals.

- Coordinate with and address relevant concerns from the Menominee County Comprehensive Plan, 2030 - Transportation Goals, Strategies and Recommendations.
  - Investigate safety concerns on STH 47/55 between the Shawano/Menominee County line and CTH VV.
  - Ensure that local children have the ability to safely walk and bike to the Menominee Indian Middle School in Neopit. Pursue a Safe Routes To School (SRTS) program.
  - Continue to work with Menominee Public Transportation to provide public transportation to all residents of the County and Menominee Indian Tribe of Wisconsin.
  - Ensure that residents have access to County and Tribal services. Population centers within the county are concentrated in the unincorporated communities of Keshena, Neopit, Zoar, Middle Village (Shawano County), South Branch and the lakes area in the southeast corner of the county. County and Tribal services are currently found in the unincorporated community of Keshena. In the future additional Tribal services may be available in Middle Village (Shawano County).
  - Address medical transportation needs for County and Tribal veterans.
  - Accommodate bicyclists and pedestrians in areas of high activity or concentrated development. People may be more willing to walk or bike if using these modes can be done safely and conveniently.
  - Address All Terrain Vehicle (ATV) use in the County. ATV's have wide spread use within Menominee County. To establish a safe location for vehicle rider-ship and to address erosion and other maintenance issues, the Town/County along with the Menominee Indian Tribe of Wisconsin should work together to establish an ATV trail system.

- STH 55 from Langlade County Line (North) to CTH M, had higher injury and fatality rates than State averages. This particular section also had high total crashes related to vehicle running off into a ditch (21) or a tree (15). It is recommended that this segment be further evaluated to determine reasons for crashes.
- In some cases, specifically in Keshena, Legend Lake and Middle Village, the 2010 population of non-drivers is more than 50 percent of the total population. It is recommended that an analysis take place in these areas on non-driving populations and their access to transit and non-motorized modes.
- Municipalities including Keshena, Neopit and Zoar have larger number of households who don't have access to a vehicle compared to Legend Lake and Middle Village. Further analysis is needed to ensure users in Keshena, Neopit and Zoar have adequate access to transit.
- There is a high percentage of un-employed compared to employed in Middle Village, Neopit and especially Zoar. Further analysis is needed to ensure adequate transportation services are available in these communities to provide opportunity to connect to local employers.
- Keshena and Neopit have high numbers of citizens that walk to work. Further analysis is needed to see if there are adequate non-motorized facilities for MITW citizens to get to work. Legend Lake and Zoar have the highest mean travel time to work, with almost nobody walking. Further analysis is needed to see where major employers are located in comparison to Legend Lake and Zoar.
- Menominee County has 22 percent of the workforce commuting outside the county.
- Keshena, Middle Village and Neopit have higher number of people living in group quarters. Further analysis needs to be done to determine what facilities these people are living in and do the they have adequate access to transportation.